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**Mathematical analysis
on the self-organization and self-similarity**

edited by Takayoshi Ogawa and the editorial board

December, 2009

Research Institute for Mathematical Sciences
Kyoto University

RIMS Kôkyûroku Bessatsu B15

*Mathematical analysis
on the self-organization and self-similarity*

September 16 ~18, 2008

*edited by Tatsuyuki Nakaki, Takasi Senba, Takayoshi Ogawa(chief),
Mishio Kawashita and Masaki Kurokiba*

December, 2009

Research Institute for Mathematical Sciences

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Preface

The international conference “Mathematical analysis on the self-organization and self-similarity” was held from 16th to 18th, September 2008 at Kyoto University, Kyoto, Japan as the project conference of the Research Institute of Mathematical Science (RIMS), Kyoto University.

The mathematical analysis on the model of the chemotaxis has been largely developed particularly during the last 15 years. One of the pioneer work on the singularity formation was done by Professor Toshitaka Nagai of Hiroshima University and after that there are many interesting works were continuously done around this area.

On the other hand, the mathematical analysis on the semiconductor device simulation has longer history and it is now well recognized that the both theory are closely related involving the mathematical analysis of the fluid mechanics.

The organizing committee of the conference (all the editorial board with Tatsuyuki Nakaki as the chair) considered that it is a good opportunity to organize an international conference in the occasion of Professor Nagai’s sixtieth birthday and the conference was planned to make a bridge between the chemotaxis model and the semiconductor device simulations. The topics were selected within the mathematical research on the system of nonlinear parabolic equation mainly concentrated on the chemotaxis model and the semiconductor device simulations as well as their natural origin of the fluid mechanics. Ten invited speakers including overseas researchers gave splendid lectures on their latest research and many stimulated discussion around the talks were done. The conference had more than 80 participants.

This volume of the RIMS Kôkyûroku Bessatsu is devoted as the proceedings of the conference and the main contributors are the original plenary speakers and attendant researchers.

We hope that this volume is presenting the latest research that bring further development on the mathematical analysis of the non-local type nonlinear partial differential equations.

Takayoshi Ogawa (Editor in chief)

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